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09/488,265	01/20/00	MARTIN	5808.200-US

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EXAMINER	
RAMIREZ, L.	

ART UNIT	PAPER NUMBER
1652	

DATE MAILED: 10/31/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/488,265	MARTIN, LEHMANN	
	Examiner	Art Unit	
	Delia M. Ramirez	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) *7-13* is/are withdrawn from consideration.

5)☒ Claim(s) *3 and 6* is/are allowed.

6)☒ Claim(s) *1,2,4,5 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3 and 7* .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

DETAILED ACTION

Status of Application

Claims 1-14 are pending.

Applicant's election without traverse of Group I (claims 1-6 and 14) in Paper No. 14, filed on 9/28/2001 is hereby acknowledged. Claims 7-13 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

1. The drawings have been reviewed and are approved by a draftsperson under 37 CFR 1.84 or 1.152.

2. The abstract of the disclosure is objected to because of typographical errors (i.e. "toto" in line 5). Correction is required. See MPEP § 608.01(b).

3. The specification is objected for not complying with sequence rules. Applicant is required to insert sequence identifiers in front of sequences referred to in the specification. See particularly 37 CFR 1.821(d). Appropriate correction is required.

Claim Objections

4. Claims 4 (iii) and 5 (iii) are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. See MPEP § 608.01(n).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 (claim 14 dependent thereon), 2, 4, and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 1 and 2 are indefinite in the recitation of " at least 93.8% identical to" and " at least 95.88% identical to", respectively, because a recitation of any percentage identity is not an objective property of molecules but a value which must be independently calculated, using an algorithm with defined parameters. In the absence of a statement indicating such algorithm and the corresponding parameters, the actual metes and bounds of the subject matter claimed cannot be established. The specification does not indicate which algorithm is being used, therefore, one of ordinary skill in the art cannot clearly determine the subject matter which Applicant regards as his invention.

7. Claims 4 is indefinite in the recitation of "A phytase that comprises an amino acid sequence chosen from (i) consensus phytase-10-thermo[3]" because it is unclear which amino acid sequence is being claimed without the presence of a sequence identifier. It is suggested that Applicant indicates the sequence being claimed by adding a sequence identifier (i.e. SEQ ID NO: 31).

8. Claim 4 (iii) is indefinite in the recitation of "amino acids 27-467 of any of the sequences of (i) and (ii)" because it is unclear which amino acids are being claimed absent a statement

indicating the sequence identifiers of the variants of (i). Without a defined sequence, it is not possible to determine where amino acid 27 and 467 are.

9. Claims 4 and 5 are indefinite in the recitation of "(ii) variants of (i), further including the mutations Q50T, K91A, or (Q50T+K91A)" because it is not clear where these mutations are and which substitutions are being made. The nomenclature used by Applicant is not conventional. It is suggested that the claimed mutations be clearly indicated (i.e. glutamine at position 50 replaced by threonine, or Gln at position 50 replaced by Thr).

10. Claim 5 is indefinite in the recitation of "A phytase that comprises an amino acid sequence chosen from (i) consensus phytase-1-thermo[8]" because it is unclear which amino acid sequence is being claimed without the presence of a sequence identifier. It is suggested that Applicant indicates the sequence being claimed by adding a sequence identifier (i.e. SEQ ID NO: 29).

11. Claim 5 (iii) is indefinite in the recitation of "amino acids 27-467 of any of the sequences of (i) and (ii)" because it is unclear which amino acids are being claimed absent a statement indicating the sequence identifiers of the variants of (i). Without a defined sequence, it is not possible to determine where amino acid 27 and 467 are.

12. Claim 5 (v) is indefinite in the recitation of "nucleotides 1-1407 or 79-1407 of SEQ ID NO: 28" because there are only 1404 nucleotides in SEQ ID NO: 28. Applicant is requested to clearly indicate the nucleic acid fragments claimed.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. Claims 4 and 5 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 4 (ii) and 5 (ii) are directed to variants of consensus phytase-10-thermo[3] and consensus phytase-1-thermo[8], respectively. The specification indicates that variants of a phytase include, but are not limited to, consensus phytase-1 wherein at least one of the following replacements have been effected: Q50L, Q50T, Q50G, Q50T-Y51N, Q50L-Y51N, or Q50T-K91A (page 8 of the specification). No description has been provided of the genera of variants of consensus phytase-10-thermo[3] and consensus phytase-1-thermo[8] encompassed by the claims. No information beyond the characterization of consensus phytase-10-thermo[3], consensus phytase-1-thermo[8], the variant Q50T+K91A shown in Figure 8, and the variant Q50T+K91A shown in Figure 7 has been provided by Applicant that would indicate possession of the claimed genera of polypeptides. The specification has no disclosure of the functions of all the variants of consensus phytase-10-thermo[3] and consensus phytase-1-thermo[8]. Each genus of polypeptides claimed is a large variable genus including peptides with a wide variety of functions. Therefore, many functionally unrelated polypeptides are encompassed within the scope of these claims. The specification only discloses a few species of the claimed genera which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Thus, one skilled in the art cannot reasonably conclude that Applicant had possession of the claimed invention at the time the instant application was filed.

14. Claims 4 and 5 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for consensus phytase-10-thermo[3], consensus phytase-10-thermo[3] with the mutations Q50T and K91A, consensus phytase-1-thermo[8], consensus phytase-1-thermo[8] with the mutations Q50T and K91A, the variant Q50T+K91A shown in Figure 8, and the variant Q50T+K91A shown in Figure 7, does not reasonably provide enablement for all the possible variants of consensus phytase-10-thermo[3] and consensus phytase-1-thermo[8]. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The criteria for undue experimentation, summarized in *re Wands*, 8, USPQ2nd 1400 (Fed. Cir. 1988) are: 1) quantity of experimentation necessary, 2) the amount of direction or guidance presented, 3) the presence and absence of working examples, 4) the nature of the invention, 5) the state of prior art, 6) the relative skill of those in the art, 7) the predictability or unpredictability of the art, and 8) the breath of the claims.

Claims 4 (ii) and 5 (ii) are so broad as to encompass any variant of consensus phytase-10-thermo[3] and consensus phytase-1-thermo[8]. The specification does not disclose information about the functions of the claimed genera or the critical structural elements within the variants of consensus phytase-10-thermo[3] and consensus phytase-1-thermo[8] which are required in order to maintain the desired function such as the catalytic domain, the binding domain, and the like. No examples of variants of consensus phytase-10-thermo[3] and consensus phytase-1-thermo[8] are provided with the exception of consensus phytase-10-thermo[3] with the mutations Q50T and K91A, consensus phytase-1-thermo[8] with the mutations Q50T and K91A, the variant

Q50T+K91A shown in Figure 8, and the variant Q50T+K91A shown in Figure 7. The claimed general includes polypeptides which may not have phytase activity. The state of the art teaches that even small amino acid substitutions can render totally different proteins with different functions. Broun et al. (Science 282 :1315-1317, 1998) teaches that as few as four amino acid substitutions can convert an oleate 12-desaturase into a hydrolase and as few as six amino acid substitutions can transform a hydrolase to a desaturase. Similarly, Van de Loo (Proc. Natl. Acad. Sci. 92:6743-6747, 1995) teaches that peptides of approximately 67% homology to a desaturase from *Arabidopsis* where found to be hydrolases once tested for activity. Therefore, due to the lack of relevant examples, the amount of information provided, the lack of knowledge about the critical elements required to maintain the desired function, and the unpredictability of the prior art in regard to function based on homology, one of ordinary skill in the art would have to go through the burden of undue experimentation in order to screen and isolate those variants which have the desired activity. Thus, Applicant has not provided sufficient guidance to enable one of ordinary skill in the art to make and use the invention in a manner reasonably correlated with the scope of the claims.

15. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the phytase of SEQ ID NO: 26, does not reasonably provide enablement for a pharmaceutical composition comprising the polypeptide set forth in SEQ ID NO: 26. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The criteria for undue experimentation, summarized in *re Wands*, 8, USPQ2nd 1400 (Fed. Cir. 1988) are: 1) quantity of experimentation necessary, 2) the amount of direction or guidance presented, 3) the presence and absence of working examples, 4) the nature of the invention, 5) the state of prior art, 6) the relative skill of those in the art, 7) the predictability or unpredictability of the art, and 8) the breath of the claims.

The term "pharmaceutical" implies treatment of a disease. It is unpredictable what diseases can be effectively treated using a "pharmaceutical composition" comprising a phytase. Neither the specification nor the prior art provide sufficient guidance as to what specific diseases could be successfully treated by administering a "pharmaceutical composition" comprising a phytase, therefore, attempting to identify a disease treatable using such composition would constitute undue experimentation. The specification merely indicates that (1) phytases are enzymes which will convert phytase into myo-inositol and inorganic phosphate (page 1 of the specification), (2) they are used in feed additives (page 1 of the specification) and (3) can be used to reduce the amount of phytate in animal manure (page 14). There is no indication or suggestion in the specification of the diseases that could be treatable with a pharmaceutical composition comprising phytases or how a food composition would be beneficial. Furthermore, no guidance has been provided as to what, besides a phytase, would compose such a composition. Making and testing the infinite number of compositions to find one that is effective would constitute undue experimentation. Therefore, the specification fails to enable one of ordinary skill in the art how to make and/or use the "pharmaceutical composition encompassed by the claim".

Allowable Subject Matter

16. Claims 3 and 6 are allowed.

17. The following is an Examiner's statement of reasons for allowance. The nucleic acid and amino acid molecules of claim 3 (SEQ ID NO: 25, SEQ ID NO: 26, respectively) and the amino acid sequence of claim 6 (SEQ ID NO: 27) are free of the prior art. Prior art searches indicate that the closest amino acid homologs to SEQ ID NO: 26 and SEQ ID NO: 27 have 75.5% sequence identity (BLOSUM62, Gapop 10, Gapext 0.5) (Piddington et al., Gene 133:55-62, 1993, PIR accession number JN0899) and 75.9% sequence identity (BLOSUM62, Gapop 10, Gapext 0.5) (Pasamontes et al., Appl. Environ. Microbiol., 63:1696-1700, 1997, SPTREMBL accession number 000092). Therefore, no applicable prior art has been found for the amino acid sequences of SEQ ID NO: 26 (corresponding nucleic acid sequence SEQ ID NO: 25) and SEQ ID NO: 27. Further, the prior art does not teach or suggest preparing the claimed amino acid sequences specifically, therefore said sequences are new and non-obvious.

Certain papers related to this application may be submitted to Art Unit 1652 by facsimile transmission. The FAX number is (703) 308-4556. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If Applicant submits a paper by FAX, the original copy should be retained by Applicant or Applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delia M. Ramirez whose telephone number is (703) 306-0288. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Ponnathapura Achutamurthy can be reached on (703) 308-3804. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Delia M. Ramirez, Ph.D.
Patent Examiner
Art Unit 1652

DR
October 24, 2001

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